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# CHAPTER 8

## GENERAL HEALTH, MEDICAL, AND SAFETY

### **HEALTH, MEDICAL, AND SAFETY RELATED ISSUES FOUND IN THE WORKPLACE**

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# CHAPTER 8

## GENERAL HEALTH, MEDICAL, AND SAFETY

### HEALTH, MEDICAL, SAFETY, AND ENVIRONMENTAL ISSUES FOUND IN THE WORKPLACE

#### 8.00 INTRODUCTION

This chapter presents information about personal health and safety issues, and unique environmental health issues not generally associated with specific safety and health regulations covered in other chapters of this manual.

#### 8.01 PURPOSE

The purpose of this chapter is to provide a source of information about Departmental policies, procedures, and work practices that do not fall under commonly known regulations and/or standards.

#### 8.02 BACKGROUND

The policies, procedures, and work practices presented in this chapter are based on a variety of sources including; Directors Policy Directives, Deputy Directives, Governor's Executive Orders, Department of General Services Management Memos, Department of Rehabilitation - The Americans With Disabilities Act (ADA), State Administrative Manual (SAM), and information from the State Department of Health Services, and the State Medical Officer. Additional information has been obtained from county departments of health and agriculture, and/or college or university publications.

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### 8.03 SMOKING POLICY

- **Smoking is prohibited in Caltrans buildings and vehicles.**

Deputy Directive Number DD-06, Revised 5-1-94, established the following smoking policy:

Smoking is prohibited in all State-owned or State-leased space within a building and within fifteen feet of doorways and air intake structures. Smoking is prohibited in all State-owned or leased vehicles and equipment. Private vehicles used for State business must be smoke-free, anytime a non-smoker is a passenger.

Specific outdoor smoking areas are not established but appropriate smoke litter receptacles should be provided outside State-owned or leased buildings. Signs are clearly posted, as needed, to inform employees and the public about smoking prohibitions.

Caltrans' residential tenants are permitted to establish a smoking policy within their primary residential space but are encouraged to maintain Caltrans' no smoking policy.

This policy is based upon guidelines established by Department of General Services' Management Memo's 93-30, 93-40, 94-02, 95-09 regarding smoking policies derived from Governor's Executive Order W-42-93 and Assembly Bill 291.

State building means a building owned and occupied, or leased and occupied by the State.

Within a building includes any area enclosed by the outermost walls of the building, such as, atriums, balconies, stairwells, and similar building features.

Residential space means a private living area and excludes common areas, i. e., lounges, and rest rooms that are a structural part of a building such as a dormitory.

Vehicles and equipment mean any motor vehicle as defined in Section 415 of the California Vehicle Code (CVC). The prohibition also includes all state owned mobile equipment including light and heavy duty trucks, cargo and passenger vans, buses, and any other mobile equipment with an enclosed driver/passenger compartment regardless of ventilation.

Managers and supervisors are expected to enforce this policy and initiate appropriate disciplinary action whenever they observe any violation.

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**8.04 FIREARMS AND WEAPONS POLICY**

- **It is illegal for any employee or member of the public to bring a firearm or weapon into a Caltrans building or vehicle.**

Deputy Directive Number DD-22, effective 6-3-94, established the following firearms and weapons prohibition policy based on Section 171b of the California Penal Code:

“It is illegal for any employee and/or member of the public to bring into or possess firearms or dangerous weapons in a state or local public building and in Caltrans vehicles”.

The policy applies to all Caltrans-owned buildings, leased spaces, including space within buildings shared with other departments or agencies, Caltrans vehicles and motorized equipment, and Department of General Services fleet vehicles used by Caltrans employees.

Prohibited weapons include, but are not limited, to the following:

1. Any firearm loaded or unloaded.
2. Dangerous weapons including switchblade knives, clubs, metal knuckles, etc. (A complete list is contained in Penal Code Section 12020.)
3. BB or pellet guns, CO2 or spring action, spot marker or paint guns.
4. All knives with a fixed or fixable blade exceeding 4 inches.
5. Tear gas weapons, taser guns, or stun guns. (Includes pepper spray and mace spray, or similar tear gas type spray devices.)

In the event there is credible information that a person is in violation of this policy, notify your supervisor, building manager, or building security guard. The building manager and/or security personnel should contact the California Highway Patrol (CHP) or local law enforcement agency as may be deemed necessary. Employees should refrain from attempting to retrieve or confiscate weapons.

NOTE:

Questions regarding this policy should be directed to the Chief, Operations Security Program in the Administrative Service Center in Sacramento.

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**8.05 USE OF BICYCLES**

Bicycles may be used for transportation on Official State business and employees may be reimbursed for using their privately-owned bicycles.

Employees who use bicycles on State business shall comply with the following safety and health guidelines.

State-owned and privately-owned bicycles shall have appropriate safety equipment as required by the California Vehicle Code (CVC), and stated in Division 11 Rules of the Road, and other divisions as required. The safety equipment shall include brakes, reflectors, and headlamp if operated during hours of darkness.

Supervisors shall ensure that all employees who operate a bicycle on State business possess reasonable knowledge and understand the provisions of the California Vehicle Code governing the operation of a bicycle upon the highways, the knowledge and understanding of traffic signs and signals, including the bikeway signs, pavement markings and delineation, and traffic control devices as established by Caltrans.

Employees who are authorized to use a bicycle for official State business shall use appropriate personal protective safety equipment as directed by his/her supervisor.

Personal protective safety equipment shall include an approved bicycle helmet, vest, shirt, or jacket of appropriate color equipped with reflective material for periods of darkness, safety glasses, and other appropriate bicycle safety apparel. See Chapter 12 PERSONAL PROTECTIVE EQUIPMENT (PPE), Section 12.20 WARNING GARMENTS, for details.

When a privately-owned bicycle is used in the conduct of official State business, the employee will be allowed to claim reimbursement as provided for in the Department of Personnel Administration (DPA) Rule 599.627(c).

The Accounting Program Manager may require an employee to file Form 0205A, AUTHORIZATION TO USE PRIVATELY-OWNED VEHICLES ON STATE BUSINESS, to ensure reimbursement for authorized bicycle travel expenses. A sample of the form is shown at the end of Chapter 17 - MOTOR VEHICLE SAFETY.



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## **8.06 EMERGENCY ACTION PLAN REQUIREMENTS FOR ALL WORK LOCATIONS**

- **Introduction**

The General Industry Safety Orders, Section 3220 - EMERGENCY ACTION PLAN, requires all Caltrans facilities, including leased or rented space, to have written emergency action plans available that establish a continuous state of readiness and preparedness for protection of employees during emergencies.

Facility managers and/or building managers are responsible to develop emergency action plans annually.

- **Content and scope of emergency action plans**

The purpose of emergency action plans is to provide easy-to-follow written instructions that protect employees during emergencies, and shall contain the following minimum requirements:

- emergency evacuation route assignments;
- a distinctive signal for alarm purposes;
- procedures to account for all employees\* before and after evacuation;
- procedures for those who remain to operate critical plant equipment;
- an established fire alarm system (may be an alarm or a procedure);
- procedures to respond to incidents of workplace violence; and,
- procedures to respond to personal injury associated with incidents of crime in the workplace.

Emergency action plans should also include details showing the location of:

- |                                  |                            |
|----------------------------------|----------------------------|
| • medical and first aid supplies | • evacuation routes        |
| • handicap facilities            | • emergency lighting       |
| • fire extinguishers             | • shelters, if appropriate |
| • command center, if appropriate | • hazardous materials      |

Building Managers shall distribute copies of emergency action plans covering each building under their jurisdiction to all supervisors, managers, and individuals who are assigned specific duties such as emergency coordinators, work area monitors, or first aid response team members.

\* Provisions for emergency preparedness and evacuation procedures for persons who may need special assistance, and persons with disabilities is included in Section 8.07 below.

- **FIRE EXTINGUISHERS**

Caltrans policy covering the use of portable fire extinguisher is as follows:

Employees are not required to fight fires and should evacuate the building immediately in case of a fire. Employees may use fire extinguishers to fight small, incipient stage fires only if they have been trained in the proper use of a fire extinguisher and are confident in their ability to cope with the hazards of a fire. In any case, fire fighting efforts must be terminated when it becomes obvious that there is danger of harm from smoke, heat, or flames.

- 1. ONLY TRAINED PERSONNEL SHOULD ATTEMPT TO EXTINGUISH A FIRE.**
- 2. TRAINED EMPLOYEES SHOULD ONLY ATTEMPT TO EXTINGUISH SMALL FIRES THAT CAN SAFELY BE CONTAINED.**
- 3. EMPLOYEES SHOULD NOT ATTEMPT TO EXTINGUISH A FIRE THAT MAY PLACE THEM IN PHYSICAL DANGER.**

- In case of a fire, immediately call the Fire Department - 9 1 1 or other appropriate number.
- If a decision is made to attempt to contain a fire, someone must always call the Fire Department first.
- Do not wait until the fire is out of control before calling for help.

Supervisors and District/Headquarters building managers are responsible to ensure that portable fire extinguishers are properly located, maintained, and inspected in compliance with applicable local and/or State fire regulations. Fire extinguishers should be located in areas that:

- provide uniform distribution;
- are accessible and visible;
- are free from blockage by storage and equipment;
- are near normal paths of travel;
- are near entrance and exit doors, and
- are free from potential physical damage.

Emergency action plans should include information about the particular alarm system that may be in-place at a facility and what employees can expect when the alarm is activated.

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**8.07 EMERGENCY ACTION PLAN AND EVACUATION REQUIREMENTS  
SPECIFICALLY FOR THE AMERICANS WITH DISABILITIES ACT (ADA)**

- **Introduction**

This section provides information for facility managers and building managers about maintaining a continuous state of readiness to protect persons with disabilities and others who may need special assistance during an emergency.

This section also provides instructions for supervisors and emergency response team members about carrying out emergency evacuation procedures.

These instructions are based on standards established by the Americans With Disabilities Act (ADA) which requires every employer to provide for and recognize that persons with disabilities and others may need special assistance during emergencies.

- **Purpose**

The purpose of this section is to provide information unique to persons with disabilities and others who may need special assistance during an emergency.

This section discusses detection of emergencies, methods of notification, and evacuation procedures and classifications of disabilities established by the Americans With Disabilities Act (ADA), and offers suggested techniques to assist persons during an evacuation.

Personnel who develop and write emergency action plans for persons with disabilities must understand that each person's capabilities and limitations are unique. To be most effective each emergency action plan must be designed to meet the needs of the individual.

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- **Action Steps for Evacuation Procedures**

To provide for safe evacuation of persons with disabilities, and others who may need special assistance during an emergency, the following action steps shall be included in all emergency action plans:

**DETECTION:** Detection is the action step for discovery of an emergency to provide adequate notice for safe and timely evacuation.

The detection of emergencies is generally accomplished by automatic alarm systems which usually include an audible alarm, a “public address”, and PA system, while others may be initiated by whistles, alarms, horns, etc.

Another method is the use of manual pull stations which generally include a “In Case of Fire Break Glass” device as part of the alarm system. Whatever detection system is used, it must accommodate persons with physical and/or mobility impairments.

In order to include provisions for persons with disabilities, facility managers must consider contingencies in their emergency action plans about the discovery of an emergency to accommodate persons with special needs.

**NOTIFICATION:** Notification is the action step to notify all employees of an emergency and that evacuation to a predetermined point of safety must begin.

Traditionally, notification of an emergency by an audible alarm is usually sufficient to evacuate a building. However, employees with hearing impairments may need alternative alarm methods. Alarm systems should not only be audible but visible as well, using flashing lights or similar visual devices to help hearing impaired persons to evacuate.

To provide for their notification and assistance in emergency action plans facility managers and supervisors must be informed as to the locations where employees with hearing impairments work before an emergency situation exists.

**EVACUATION:** Evacuation means that people must be able to exit a building to protective exitways safely. Evacuation procedures must accommodate persons with disabilities: mobility, hearing, sight, or temporary disabilities.

The greatest range of special needs exists during an evacuation when trying to move people to safe areas. For example, people using wheelchairs or other obvious mobility impairments are the most easily recognized; but, there are many who may not appear to have limitations who will also require special assistance.

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- **The Americans With Disabilities Act (ADA) Classification of Disabilities**

Provisions for the following classifications of disabilities shall be included in all emergency action plans.

MOBILITY IMPAIRMENT

Individuals with varying degrees of mobility impairments, ranging from walking slowly to use of wheelchairs and other prosthetic devices.

HEARING IMPAIRMENTS

Individuals with hearing impairments may require visual aids during an evacuation.

VISUALLY IMPAIRED

Individuals with visual impairments may require special assistance. Managers and supervisors are encouraged to provide an advance walk-through of the evacuation routes and to discuss the assistance available to them during an emergency.

TEMPORARY IMPAIRMENTS

Individuals with temporary impairments, such as a person recovering from traumatic injuries, a broken leg, sprained ankle or surgeries may tire easily and may need special assistance or more time to evacuate.

KNOWN MEDICAL CONDITIONS

Individuals with known medical conditions such as respiratory disorders or pregnancy may need special assistance such as physical body support or more time to evacuate.

MENTAL IMPAIRMENTS

Individuals with mental impairments may become confused when challenged with the unusual activity during an emergency, lose their sense of direction, or may require emergency directions that are broken down into simplified steps or basic concepts.

### OTHER

Some individuals may panic or freeze during emergencies and may need assistance such as talking to them calmly and slowly while helping them to evacuate.

### VISITORS

The possibility that visitors may be at a Caltrans worksite during an emergency should be included in emergency action plans. Visitors may have small children with them and may require extra time to evacuate.

- **Identifying Persons with Special Needs and/or Disabilities**

Persons with disabilities may have special needs and require accommodations during an emergency. Employees who need assistance are encouraged to tell their supervisor and emergency response personnel about their specific need.

It must be understood that there are individuals who are protective of their right to independence and privacy and who may be reluctant to have their disability or needs identified.

#### NOTE:

Supervisors are responsible to maintain a copy of the Form ADM 0131, EMERGENCY NOTIFICATION INFORMATION, for each employee in their files at the worksite for emergency information purposes.

The form provides space for the employee to advise their supervisor that they may need assistance during an emergency evacuation.

See Chapter 9 - FIRST AID AND EMERGENCY MEDICAL TREATMENT, Section 9.06 WHOM TO NOTIFY IN CASE OF AN EMERGENCY, for more details.

The form provides for a "YES" or "NO" answer only. The form shall not state the reason for the assistance. The request for assistance and the disclosure of any specific medical or personal information is voluntary and shall remain confidential.

Employees with permanent or temporary disabilities often have special needs during emergencies. This information must be made available to the supervisor and emergency personnel before an emergency arises.

After a request for special assistance has been made, the supervisor shall arrange for the building manager and members of the local emergency evacuation team to contact the employee to discuss the best way to provide the needed assistance.

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- **Assistance Techniques During Evacuation**

The following techniques should be followed whenever assistance is provided to persons with disabilities during evacuation:

MOBILITY IMPAIRMENT

Persons in wheelchairs may be able to assist themselves. Some wheelchair users are trained in special techniques to transfer from one chair to another. Ask the employee how best to assist them.

Someone using a crutch or a cane might be able to negotiate stairs independently. It is best not to interfere with a person's movement unless he/she asks for help.

HEARING IMPAIRMENT

Persons with hearing impairments may need special notification:

- Flick the lights on and off when entering the work area or gently tap their shoulder to alert them of an emergency.
- Establish eye contact with the individual, even if an interpreter is present.
- Use facial expressions and hand gestures as visual cues.
- Check to see if you have been understood and repeat if necessary. Written communications may be especially important if you are unable to understand the individual's speech.
- Be patient; the individual may have difficulty comprehending the urgency of your message.
- Provide such individuals with flashlights for signaling their location in the event they are separated from the rescuing team or person assisting them, and to facilitate lip-reading in the dark.

## VISUAL IMPAIRMENT

Persons with vision impairments may need special notification:

- Announce your presence when entering the work area.
- Speak naturally and directly to the individual.
- Offer assistance but let the person explain what help is needed.
- Describe the action to be taken in advance.
- Guide the individual, grasping your arm or shoulder to the exit.
- If leading several persons with visual impairments at the same time, ask them to hold each others' hands.  
(This same technique should be used with normal vision persons if in a dark room or hallway, etc.)
- Make sure that after exiting the building that individuals with impaired vision are not "abandoned" but are led to a place of safety, where colleague(s) shall remain with them until the emergency is over.

### When Assisting Owners of Guide Dogs

- When the dog is wearing its harness, the dog is on duty; if you want the dog not to guide its owner, have the person remove the dog's harness.
- Plan for the dog to be evacuated with the owner.

## LEARNING DISABILITIES

Persons with learning disabilities may have difficulty in recognizing an emergency. Consider the following ideas when assisting persons with disabilities:

- Their visual perception of written instructions or hand signs may be confused.
- Their sense of direction may be limited, requiring someone to show them the exit.
- Their ability to understand is often more developed than their vocabulary.
- Person's with these types of impairments should be treated like an adult who happens to have a cognitive or learning disability.

Persons who may panic, or show signs of fear, during emergencies may also have difficulty in responding to direction and may need special understanding.

For additional information regarding ADA, contact the Disabilities Opportunity Program Administrator, in the Office of Equal Opportunity in Sacramento.



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## 8.08 COMMUNICABLE DISEASE PROTECTION

- **General Information**

This section provides information about ways to reduce the risk of contacting a disease through exposure to body fluids, including blood.

- **Protection Kits**

The Department provides protection kits to employees who administer first aid and/or CPR. The protection kits contain the following types of items:

- ziplock storage bag
  - vinyl or latex gloves
  - face mask/eye shield
  - mouth barrier <sup>1</sup>
  - antiseptic towelette
  - a germicidal wipe which contain benzalkonium chloride and isopropyl alcohol
  - red bio-hazard disposal bag <sup>2</sup>
1. Because of different vendors and the variety of manufactured mouth barriers available, protection kits are not always supplied with same type of mouth barrier device.

NOTE: See Chapter 9 - FIRST AID AND EMERGENCY MEDICAL TREATMENT, Section 9.13 MOUTH BARRIERS (CPR MASK).

2. Some protection kits may contain a red bio-hazard bag embossed with the statement "DANGER INFECTIOUS WASTE."

The bag is used to store contaminated first aid supplies that may have been used to wipe a victim's body fluids, including blood. Employees should dispose of the bio-hazard bag with the attendant medical provider, the ambulance attendant, the EMT, etc., at the accident scene.

Because of the variety of mouth barriers and protection kits available some package or container sizes may not easily fit into the first aid kit box. Suitable alternative storage may be required. Taping a package or container to a first aid kit box is acceptable.

Adequate supplies of mouth barriers and/or protection kits should be maintained at worksites and in motor vehicles. Supervisors may order additional mouth barriers or protection kits to accommodate their needs.

## 8.09 BLOODBORNE PATHOGENS

- **General Information**

The Bloodborne Pathogen Regulation, Section 5193, General Industry Safety Orders requires precautions in dealing with contaminated materials that have body fluids, including blood and tissues that may spread infections.

This Cal-OSHA standard applies **only** where employees may reasonably have **occupational exposure** to blood or other potentially infectious materials.

Under the Cal-OSHA standard occupational exposure means employees who regularly work as health care providers or work in similar work disciplines.

Caltrans does not have any job descriptions or work activities that qualify under the occupational exposure definition. For example, volunteer first aid responders and/or evacuation monitors do not qualify under the definition.

Because the Cal-OSHA Bloodborne Pathogen regulation (Section 5193) **does not apply to Caltrans employees or its operations**, the information contained in this Bloodborne Pathogens section is provided for general information only.

It is Caltrans policy not to provide pre-exposure injections for bloodborne pathogen exposure. However, whenever an employee is exposed or believes he/she has been exposed to contaminated material that may contain blood or other bodily fluid, post-exposure injections may be provided.

Contact the Workers' Compensation Coordinator, in the District or the Workers' Compensation Case Worker in the Administrative Service Center in Sacramento for information and assistance.

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- **Definition of Bloodborne Pathogens**

A pathogen is any organism or virus that can cause disease. A bloodborne pathogen is an organism or virus carried by blood or other bodily fluid.

The two most significant bloodborne diseases that employees can be exposed to are Hepatitis B Virus (HBV) and Human Immunodeficiency Virus (HIV).

HBV, Hepatitis means “inflammation of the liver.” HIV, the human immunodeficiency virus attacks the body’s immune system, causing the disease known as AIDS, or Acquired Immune Deficiency Syndrome.

- **Transmission of Bloodborne Pathogens**

Bloodborne Pathogens are transmitted primarily through contact with blood and some body fluids, but may also be transmitted through sexual contact. (HIV is not transmitted by touching or working around people who may carry the disease.)

HBV, HIV, and other pathogens may be present in body fluids, blood, and skin tissue.

Bloodborne pathogens may enter your body and infect you through a variety of means including:

- An accident/injury with a sharp object contaminated with infectious material:
  - needles;
  - broken glass; and/or
  - anything that can pierce, puncture, or cut your skin
- Open cuts, nicks, rashes, burns, hangnails, and skin abrasions even dermatitis and acne, as well as the mucous membranes of your mouth, eyes, or nose.
- Indirect transmission, such as touching a contaminated object or surface and transferring the infectious material to your mouth, eyes, nose, or open skin

HIV can survive on environmental surfaces dried and at room temperatures for at least one week.

- **Protecting Yourself Against Infection**

Employees should treat all human blood and other bodily fluids as though they are dangerous and can possibly spread infections.

Medical people are not able to tell for sure which people carry bloodborne pathogens. Both HIV and HBV infect people of all ages, of all socioeconomic classes, from every state and territory, and from rural areas as well as cities.

Many people carry bloodborne infections without visible symptoms. Many people carry bloodborne infections without even knowing they do.

Universal Precautions

Using precautions are recommended while handling all human blood and certain human body fluids as if they were known to be infected with HIV, HBV, or other bloodborne pathogens.

The following safeguards, known as “Universal Precautions” are accepted industry-wide methods, and must be used together to protect employees and reduce the risk from exposure to bloodborne pathogens:

**Engineering controls:** physical or mechanical systems to eliminate hazards at their source. Specially marked bags or containers for contaminated first aid materials, and “sharps” containers are two examples.

A “sharps” is the term used for all sharp syringes, needles or other objects that can puncture skin. A “sharps” container is any container, either specially designed for needles, or it can be a temporary container such as a beverage can.

**Employee work practices:** procedures shall be used on the job to reduce risk of exposure to bloodborne pathogens or infectious materials. Report any sharp objects found at the workplace immediately. Do not touch sharp objects with your hands. Remove and place in a sharps container.

Hand washing will prevent contamination to other surfaces. Use of gloves, face shields, aprons may also be appropriate. Do not eat, drink, smoke, apply cosmetics or lip balms, or handle contact lenses where you may be exposed to blood or bodily fluids.

**Personal protective equipment:** equipment that protects you from contact with potential infectious materials; this may include gloves, masks, aprons, protective eye wear, or protective CPR ventilation masks.

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**Housekeeping:** clean and decontaminate all work areas that may be the source of bloodborne infectious materials. Clean all equipment and working surfaces. Do not pick up broken glass which may be contaminated with gloves or bare hands. Use tongs or a brush and a dust pan.

Use 1/4 cup of household bleach per one gallon of water to decontaminate spilled blood. If you are spraying on a hard surface, just spray and wipe off. If the surface is porous, spray, let stand for few minutes, then wipe off. Use a ratio of 1 part bleach to 10 parts of water.

Follow the Environmental Protection Agency (EPA) list of regulated germicides when purchasing disinfectants. The disinfectant should have a specific reference to HIV or HBV effective. Products should contain information that they are effective for HIV and HBV, not just one.

- **Medical Evaluation and Treatment**

Employees who believe they have been exposed to infection should be evaluated at the time of exposure by a doctor to determine what type of medical treatment is indicated.

(Managers and supervisors should review Chapter 9 - FIRST AID AND EMERGENCY MEDICAL TREATMENT for details concerning medical treatment and medical clinics.)

If an employee has a specific personal medical concern regarding HBV vaccine, the employee should contact their personal physician for advice.

The Cal-OSHA standard requires employers to provide Hepatitis B vaccine for post-exposure to some work groups. Some work activities conducted by Caltrans may qualify for post-exposure vaccine.

Because the Cal-OSHA standard does not specifically apply to Caltrans operations and/or job descriptions, every incident of alleged HBV exposure will be handled on a case-by-case basis.

Contact the District or Headquarters Office of Safety and Health or Workers' Compensation Program Coordinator for assistance.

## 8.10 TUBERCULOSIS

- **General Information:**

Tuberculosis, or TB, is a disease caused by bacteria. This bacterium can attack any part of your body, but usually attacks the lungs. Tuberculosis was once the leading cause of death in the United States. After effective drug treatment was discovered in the 1940's, TB slowly began to disappear in the United States. However, cases of TB and outbreaks continue to be reported.

It is important to understand that there is a difference between being infected with TB and having TB disease. Someone who is infected with TB has the TB germs or bacteria in their body. The immune system of the body protects them from the germs and they are not sick.

A person with TB disease needs to be under the care of a physician. A person with TB disease that is not being treated **CAN** infect others. Bacteria are spread through the air when a person with TB disease coughs or sneezes. People nearby may breathe in these aerosolized bacteria and become infected. TB is usually spread between family members, close friends, and people who work or live together. It is spread most easily in closed spaces over a long period. In most people, the body is able to fight the bacteria and stop them from growing. The bacteria become inactive, but they remain alive in the body and can become active later. Handling a person's linens, books, furniture, or eating utensils does **NOT** spread the infection. Brief exposure to a few TB germs rarely infects a person. Close contact day after day increases the risk. Because TB spreads in small closed spaces where air does not circulate well, try to keep good ventilation around you to dilute any bacteria that may be in the air.

- **Symptoms:**

A person with TB infection will have **no** symptoms. A person with TB disease may have any, all or none of the following symptoms:

- A cough that will not go away
- Feeling tired all the time
- Weight loss
- Loss of appetite
- Fever
- Coughing up blood
- Night sweats

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These symptoms can also occur with other types of lung disease so it is important to see a doctor to determine if you have TB. It is also important to remember that a person with TB disease may feel perfectly healthy or may only have a cough from time to time. If you think that you have been exposed to TB, see your doctor for a TB skin test. Several other tests must be completed to determine if the person who has TB infection also has TB disease.

The advice for most people is to get a TB skin test if you have symptoms or if you are living in close contact with or have otherwise been in contact with someone who recently came down with TB disease. Groups of people who are considered high risk for developing TB disease include the following:

- People with HIV infection (the AIDS virus)
- People in close contact with those known to be infectious with TB
- People with medical conditions that make the body less able to protect itself from disease (for example: diabetes, the dust disease silicosis, or people undergoing treatment with drugs that can suppress the immune system, such as long-term use of corticosteroids)
- Foreign-born people from countries with high TB rates
- Some racial or ethnic minorities
- People who work in or are residents of long-term care facilities (nursing homes, prisons, some hospitals)
- People who are underfed
- Alcoholics and IV drug users

**IF YOU THINK THAT YOU HAVE BEEN EXPOSED TO TB, SEEK THE ADVICE OF YOUR PHYSICIAN.**

- **Treatment**

The treatment of TB depends on whether a person has TB disease or only TB infection.

Preventive therapy may be given to the person who has become infected with TB, but does not have TB disease. Preventive therapy aims to kill germs that are not doing any damage at this time, but could break out later.

A combination of several drugs is used to treat the person with active TB disease. The infected person will take these medications for six to nine months. It is very important that medications are taken correctly and for the full length of treatment. Re-infection is possible if the regimen is not followed. Subsequent infections are more difficult to treat because of resistance by the TB germs to the medication.

## **8.11 AFRICANIZED HONEY BEES (AHB)**

- **General Information**

The Africanized Honey Bee (AHB) has migrated into California. AHB's display aggressive behavior while protecting their colony location. In some reported attacks, the AHB has seriously stung or killed livestock, and humans. This behavior has earned AHB's the common name "Killer Bees".

- **Activities That Can Cause a Stinging Attack**

AHB's react to activities such as, operation of power equipment, and/or lawn mowers within 100 feet or more of a colony. Movement caused by persons walking within 50 feet of a colony can also cause an attack.

- **Pursuit Distance**

AHB's have been known to follow victims up to 1/4 mile (4 football fields). (European honey bees generally follow for up to 100 feet.)

- **Defensive Reaction Period**

AHB's will remain agitated longer than European honeybees after a colony is disturbed. AHB's remain agitated up to eight (8) hours or more before the defensive reaction subsides. (European honeybees remain agitated perhaps one (1) or more hours before the defensive reaction subsides completely.)

- **Reducing AHB Colonies**

AHB's can enter and establish a colony inside any small exterior openings in building. Supervisors should periodically inspect the work area for potential colonies and reduce them by:

- sealing any opening larger than 1/8 inch, such as pipe entrances on walls and wall siding (stucco, wood) where brick meets wood
- repairing or replacing damaged vent screens on foundations and under eaves
- trimming overgrown shrubs and trees that are located near buildings
- removing litter, emptying containers and trash
- filling in ground holes



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- **Protective Measures, Suggestions, and Recommendations**

If you find a colony of bees, leave them alone and keep others away. Do not throw rocks, try to burn or otherwise disturb the bees. If the colony is near a trail or foot path near areas frequently used by people, notify your local office of the park department, forest service, and fish and game, even if the bees appear to be docile.

Bee colonies vary in behavior over time, especially with changes in age and season. Small colonies are less likely to be defensive than large colonies, so you may pass the same colony for weeks and then one day provoke them unexpectedly. Wear light colored cloths and socks. Bees target objects that resemble their natural predators (bears and skunks) when they defend their nests, so they tend to go after dark leathery or furry objects. Keep in mind that bees see the color red as black, so wearing fluorescent orange is a better choice when hunting.

Avoid wearing scents of any sort when working near bees. Africanized honeybees communicate to one another using scents, and tend to be quite sensitive to odors. Avoid strongly scented shampoo, soaps, and perfumes.

- Employees should inspect work areas for the presence of bees and avoid disturbing colonies before the work begins. Keep escape routes in mind.
- Employees should wear appropriate protective clothing such as long sleeve shirts or coveralls, and hand and eye protection when working where bees might be present.
- If bees attack or swarm, employees should leave the area immediately and seek enclosed shelter. A shelter can be the nearest building or vehicle.
- Employees should not stay in the area. Do not stand still. Do not swat or wave at the bees. Do not try to wash bees off with water.
- The employee should cover his/her mouth and nose area immediately with a cloth or dust mask to breathe. As conditions warrant the employee's personal clothing can be used, e. g., jacket, coat, sweater, shirt-tails, etc., to cover the face.
- When the employee has found appropriate shelter away from the bees, all stingers should be removed to limit continued venom injection. Remove stingers by scraping them free. Pinching or tweezers may cause more venom being injected into the affected body part.
- After removing the stingers or if they remain present, seek medical attention. Medications for pain, itching, and allergic reaction may be required.

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## 8.12 HANTAVIRUS (ADULT RESPIRATORY DISTRESS SYNDROME)

- **General Information**

There are five strains of Hantavirus found in rodents. Four of the virus strains have caused serious health problems in other parts of the world, mainly the Far East and Scandinavia. A fifth hantavirus strain apparently unique to North America has been recently identified. The North American strain attacks the lungs, instead of the kidneys as the other strains do, resulting in the disease termed Adult Respiratory Distress Syndrome (ARDS).

The ARDS virus is believed to be principally carried by a common rodent, the deer mouse, which is found throughout North America and in every California county. Infected rodents shed live virus in saliva, feces and urine. Humans are infected when they encounter and inhale aerosolized microscopic particles that contain dried rodent urine or feces.

These guidelines provide recommendations for the prevention of exposure to hantavirus infections from rodents. They are based on established principles of control from the U. S. Department of Health Services. These guidelines contain general, but limited information. For additional information about hantavirus contact the Office of Safety and Health.

Findings from the California Department of Health Services, Division of Communicable Disease Control, strongly suggest that the hantavirus is more commonly found in rural areas, and less in urban areas. Based upon the findings by the Department of Health Services, the Caltrans Office of Safety and Health recommends the following approach for disease prevention:

- **Inspecting Possible Rodent Colony Habitats**

Supervisors who are responsible for facilities located in rural areas should develop training programs for employees so they can conduct inspections and take appropriate corrective action before entering and working in the following types of facilities:

- |   |                                   |
|---|-----------------------------------|
| • sewage lift stations                    | • wet/dry pumping plants          |
| • pump houses                             | • sand bunkers                    |
| • fuel storage bunkers                    | • bridge cells                    |
| • tanks                                   | • transmitter stations            |
| • GAZ-X avalanche control system shelters | • elevator shafts                 |
|   | • or similar enclosed facilities. |

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- **General Precautions to Prevent Rodent Infestation**

Supervisors should use the following preventive measures in buildings such as maintenance stations, dormitories, surveys or construction field offices, equipment barns and similar storage facilities in rural areas not currently infested.

1. Reduce the availability of food sources and nesting sites inside buildings and facilities.
  - store and cover food in rodent-proof containers
  - store garbage inside, when possible, in rodent-proof containers
  - remove food particles from floors and sinks
  - dispose of trash and clutter
  - use spring-loaded rodent traps
2. Prevent rodent access.
  - use steel wool or cement to seal screens, or otherwise cover openings into buildings larger than 1/4 inch
  - place metal roof flashing as a rodent barrier around the base of dwellings
  - place gravel under the basement of facilities to prevent rodent burrowing
  - locate woodpiles above ground
  - store grains and animal food in rodent-proof containers
  - haul away trash, abandoned vehicles, discarded tires
  - use EPA-registered rodenticides approved for outside use

- **Management of Buildings with Rodent Infestation**

Rodent infestation can be concluded with the presence of rodent feces in closets, cabinets, floors, or evidence that rodents have been gnawing on food.

If rodent infestation is detected inside a facility or other structure used by employees, use the following guidelines for rodent abatement:

Protecting yourself from risk of exposure

Never touch a rodent, its droppings, or its urine with bare hands. Rubber or plastic gloves should be worn when handling dead rodents, contaminated traps, or in cleaning up rodent material. Before removing gloves, wash gloved hands in household disinfectant and followed by soap and water. A sodium hypochlorite solution prepared by mixing 3 tablespoons of household bleach in one gallon of water is effective.

Protective goggles should be worn if contact with the cleaning material or rodent material is anticipated.

The use of respiratory protection should be considered when contaminated material may become aerosolized. The use of a dust mask to limit general dust exposure and to prevent contact of hands with the mouth and nose should be considered.

#### Disposing of rodents and rodent material

Except in the immediate area of a confirmed case of hantavirus infection, rodents and rodent material may be disposed of as ordinary household waste in outdoor garbage containers. An occasional rodent carcass in unaffected or urban areas can be disposed of by picking it up with a plastic bag, inverting the bag, placing it in a second bag, and disposing it as usual household waste.

In affected areas and as an additional precaution in rural areas, rodent carcasses and material should be placed in a plastic bag containing a sufficient amount of a general-purpose household disinfectant to thoroughly wet them. Seal the bag and then dispose of it as permitted by local regulations.

#### Eliminating rodent infestation

Ventilate closed buildings/facilities or areas inside buildings by opening doors and windows for at least 30 minutes. Use an exhaust fan or cross ventilation if possible. Leave the area until the airing-out period is finished. This airing may help remove or dilute any aerosolized virus produced directly by living rodents, which may urinate when startled.

Seal screens, or otherwise cover all openings into the building/facility that have a diameter of 1/4 inch or larger.

Set rodent traps inside the building, using peanut butter or other appropriate bait. Use only spring-loaded traps that kill rodents.

Treat the interior of the structure with an insecticide labeled for flea control; follow specific label precautions. Insecticide sprays or powders can be used in place of aerosols if they are appropriately labeled for flea control. Rodenticides may also be used while the interior is being treated. EPA approved rodenticides are commonly available. Instructions on product use should be followed.

Remove captured rodents (wearing gloves) from traps and dispose of in plastic bags as described above.

Leave several baited spring-loaded traps inside the building at all times as a further precaution against rodent infestation.

#### Cleaning-up rodent-contaminated areas

Always wear gloves when cleaning-up rodents and rodent material.

Spray dead rodents, rodent nests, droppings, or other items that have been contaminated by rodents with a general-purpose household disinfectant. Soak the material thoroughly, and place it in a plastic bag, and dispose of according to local regulations.

After the rodents have been removed, spray the area with a disinfectant solution. Mopping floors with the disinfectant is also suggested. **TO AVOID GENERATING AEROSOLS, DO NOT VACUUM OR SWEEP DRY SURFACES BEFORE SPRAYING OR MOPPING.**

Disinfect furniture, cabinet tops, and other durable surfaces. If clothing or fabrics have been contaminated, launder with detergent and water as hot as fabric will allow. Machine-dry on a high temperature setting or hang outdoors to air-dry in the sun.

- **Other Precautions for Rodent Infestation**

Persons involved in the clean-up should wear coveralls and hair coverings, rubber boots, disposable shoe covers, gloves, protective goggles, and an appropriate respiratory protection device, such as a half-mask air-purifying respirator with a high-efficiency particulate air (HEPA) filter or a powered air-purifying respirator with HEPA filter.

The Center for Disease Control has recommended special precautions for cleaning buildings with heavy rodent infestations. Persons conducting these activities should first contact their local health department.

### 8.13 LYME DISEASE

- **General Information**

Although the bacterium has been present in the United States for over 100 years, Lyme disease was only first recognized in 1975 after an outbreak of arthritis in children near Lyme, Connecticut.

Lyme disease is a multi-system bacterial infection caused by the bite of an infective tick. The body does not maintain a natural immunity to this disease, thus infection can reoccur. The known carrier of this bacterial disease in North America is the Western black-legged tick (*Ixodes pacificus*) in the west, and the black-legged tick (*Ixodes scapularis*) in the rest of the country. Ticks may be found anywhere, in the woods, by the seashore, even in your own backyard, although not all of these ticks will be infected with the Lyme disease bacteria. The western black-legged tick has been found in 55 of the 58 counties in California, but is most common in the humid northwestern coastal areas and the western slope of the northern Sierra Nevada.

The nymphal tick is about the size of a poppy seed and the adult is about ¼ inch in length. The tick feeds on animals and humans by embedding its mouth into the skin and sucking blood. Ticks climb to the tips of vegetation, typically along animal trails or paths, and wait for a host to brush against them. In the early stages of growth, ticks can be found in leaf litter in shaded areas.

Ticks can survive under a variety of conditions as long as they have adequate moisture. Here on the West Coast the peak season for ticks is November through April.

- **Early Symptoms**

Early symptoms of Lyme disease generally include a characteristic circular, spreading skin rash usually accompanied by flu-like symptoms such as fever, body aches, stiff neck and fatigue. These symptoms may persist, change, disappear and reappear intermittently for several weeks. Lyme disease is successfully treated with antibiotics and nearly all patients recover completely without complications. However, left untreated, symptoms can progress into heart or nervous system disorders as well as arthritis.

The skin rash known as *erythema migrans* (EM) is a red, blotchy, expanding circle that may grow to several inches in diameter three (3) to thirty (30) days after the bite of an infected tick. The rash may also clear in the middle as it grows producing a ring-like appearance. Do not confuse a local reaction to a tick bite with signs of Lyme

disease infection. A small inflamed bump or discoloration that develops within hours or over the next day from a tick bite is not likely to be due to the infection, but rather a local reaction to the disruption of the skin.

- **Late Symptoms**

Late-stage Lyme disease may not appear until weeks, months or years after the bite of an infective tick. These symptoms may include arthritis and nervous system or heart disorders. Arthritis is most likely to appear as periods of pain and swelling, usually in one or more large joints, especially the knees. Nervous system abnormalities can include numbness, pain, severe headache, impaired memory and concentration. Arthritis and nervous system disorders may occur in the absence of a recognized EM rash. Less frequently, irregularities of the heart rhythm may occur.

- **Prevention**

The chance of being bitten by an infected tick can be decreased with a few preventative measures.

- Whenever possible avoid tick-infested areas.
- Wear light colored clothing so that ticks can be easily seen.
- Tuck pant legs into boots or socks and tuck shirt tails into pants.
- Repellent registered for use against ticks may be helpful in infested areas. Always follow the directions on the label.
- Completely inspect your body at least once a day for attached ticks, especially the armpits and groin areas.
- Never use insecticides, lighted matches or solvents to remove ticks.

- **Removal**

After being outdoors in a suspected tick habitat, it is recommended that you remove all clothing, wash and dry it at a high temperature and inspect your body carefully. If you discover a tick, remove it as soon as possible to reduce the chance of infection. Proper removal of the tick within 24 hours greatly reduces the chance of Lyme disease infection. Grasp the tick as close to the skin as possible, preferably with fine nosed tweezers, pulling slowly and firmly straight out. Wash your hands and the wound with an antiseptic. If you believe you may not have removed all of the tick or you begin to experience symptoms, consult your doctor.

## 8.14 SUN SAFETY

- **General Information**

While the immediate harm, the burning and blistering is painful and to be avoided what people should fear are the long-term consequences of regular sun exposure. All of which can be prevented.

Exposure to the sun is the leading cause of skin cancer. It is estimated that fifty to eighty percent (50-80%) of a person's lifetime exposure to the sun occurs during childhood, by the age of 18. The damage from this exposure accumulates over time. There are more new cases of skin cancer reported in the United States each year than all new cases of lung, breast, prostate, and colon cancer combined. The rate of skin cancers has increased dramatically in the last few decades, in part due to a decrease in the protective ozone layer in the atmosphere and changes in our lifestyles. People have increased leisure time devoted to outdoor activities. Fashion has encouraged a marked decrease in the coverage of clothing worn. Ninety percent (90%) of skin cancer is linked to exposure to the sun. Sun Safety is an important topic for all employees, especially those who work outdoors.

- **Types of skin cancer**

There are more than 200 different forms of cancer that may eventually show up on the skin, however, only three major forms that actually originate in the skin.

*Basal cell carcinomas* make up approximately 80% of all skin cancers. Easily treated, they usually appear as a slow growing fleshy bumps or nodules. Basal cell can be found anywhere on the body but is more likely to be on the face, neck, or hands. These tumors do not spread quickly and may take months to reach the diameter of one-half inch.

*Squamous cell carcinoma* may also appear as a nodule or as a red scaly patch. The second most common skin cancer, squamous cell is generally found on the face, hands, ears, lips and mouth. This cancer will develop into large masses and can spread to other parts of the body.

*Malignant Melanoma* is the least common but most deadly of the major forms of skin cancer. This cancer usually begins as a light brown or black flat spot with irregular borders that may later become multi-colored with red, blue violet or white. It often grows from a mole. Melanoma is the most aggressive of the three types.



- **Who gets this disease**

The most significant common factor among skin cancer patients is fair skin. Lighter skin usually does not have enough melanin to protect it. Melanin is the pigment that gives skin its color. When skin is exposed to ultraviolet (UV) light, more melanin than normal is released in order to protect the skin from damage. This darkening appears as a “tan” although it is really signifying damage to the skin is taking place. This exposure to ultraviolet light also contributes greatly to:

- Premature aging
- Cataracts
- A weakened immune system

*Common Risk Factors*

1. Fair skin
2. Blue, green or hazel eyes
3. Light-colored hair
4. Freckles
5. A tendency to burn rather than tan
6. History of severe sunburns
7. Have many moles (over 50-100)
8. A personal or family history of skin cancer
9. Blistering sunburns as a child or adolescent

Skin cancer does develop in a smaller number of naturally darker skinned people, but usually appears on the lighter parts of their bodies. The tendency to get skin cancer runs in families, partly because skin types tend to be inherited. It is also believed that certain genes may contribute to skin cancer.

- **Protecting yourself against the solar hazard**

Although nothing can be done about one’s hereditary factors, everyone can do something to help protect themselves from the hazards of overexposure to the sun. UV radiation is more intense during certain times and conditions and should be avoided when possible. Times to avoid exposure are:

- From 10 a.m. to 4 p.m.
- Where there is lack of thick cloud cover
- From mid-spring through mid-fall
- At higher altitudes

Whenever possible wear wide-brimmed hats, long-sleeved shirts and other clothing with a tight weave to keep UV radiation from reaching your skin. Wear sunglasses that filter 100% of the UV rays. Broad-spectrum sunscreens with a Sun Protection Factor (SPF) of 15 or higher may be beneficial. Sunscreens are a personal item and should be purchased and tested by the user to find the type and brand best suited to their needs. Not all sunscreens will protect from both UVA and UVB radiation and one should not get a false sense of security using a sunscreen. Protection differs between brands, users, altitude and proximity to the equator. They must be applied 20-30 minutes before going out into the sun and reapplied every 2 hours or less depending upon conditions. Physically blocking the rays from the sun with clothing and shade is the best defense.

- **Early Detection**

Everyone should perform a monthly check of their skin paying close attention to any moles. Look for changes in size, shape, or color of moles and any bumps, lumps or red patches. Check your entire body including between your toes and the soles of your feet.

- **The A-B-C-D rule in detecting malignant melanoma**

**A** – *Asymmetry*: one half does not look like the other half

**B**. – *Border*: the edges are scalloped or ragged looking from one area to another; shades of black, brown, and violet, and sometimes red

**C**. – *Color*: varies, blue and white

**D**. – *Diameter*: as large as a pencil eraser (6 mm) or larger

### **The Good News:**

Fortunately, the majorities of skin cancers are local growths and do not spread from the site of origin. Malignant melanoma is one that can and does spread. If you suspect that you have any form of skin cancer, you should consult your physician immediately. When diagnosed and treated early virtually all skin cancers can be cured with the proper medical strategy.

## 8.15 HEAT STRESS

- **General Information**

Our body has a natural mechanism that regulates a core temperature of 98.6° F (37.0° C) by releasing excess heat into the air through the blood vessels near the skin's surface and through the evaporation of sweat.

Under certain conditions, your body may have trouble regulating its temperature. Consequently, your body overheats and suffers from some degree of heat stress. Moderate or severe heat stress can occur suddenly and be dangerous to your health.

- **Types of Heat Stress**

### **MILD: Minor Heat Problems.**

This is the earliest and least serious form of heat stress. Mild heat stress is always reversible and usually not dangerous unless the symptoms persist. Although you can continue work soon after treatment, always inform your supervisor if you experience mild symptoms of heat stress at work.

#### *Signs and Symptoms -*

- excessive sweating;
- painful spasms in muscles during or several hours after activity (**heat cramps**);
- tiny red bumps on the skin and a prickling sensation (**called prickly heat**); and/or
- irritability, mild dizziness, or weakness.

#### *What Your Body is Doing -*

Sweating causes your body to lose water and minerals. This imbalance causes muscles to cramp. Your sweat glands become blocked and inflamed, causing a rash. Too little blood flow to the brain causes dizziness and other symptoms.

#### *Treatment -*

- rest in a cool or shady area;
- drink water or other fluids;
- use warm moist compresses over cramping muscles, followed by a gentle massage;
- use a mild drying lotion to relieve the rash; and,
- keep skin dry and clean.

**MODERATE: Heat Exhaustion.**

A more serious form of heat stress, although the symptoms are usually reversible if treated quickly. You should take a break from work and get medical attention. Inform your supervisor immediately if you experience symptoms of moderate heat stress.

*Signs and Symptoms -*

- excessive sweating;
- cold, moist, pale, or flushed skin;
- thirst;
- extreme weakness or fatigue;
- headache, nausea, or loss of appetite;
- dizziness or giddiness; and,
- a rapid weak pulse.

*What Your Body is Doing -*

Losing too much water and minerals reduces the blood supply to your brain, muscles, and skin. Your heart works harder to maintain the blood supply.

*Treatment -*

- rest in a cool shady area;
- drink water or other fluids;
- take additional salt, if instructed by physician; and,
- use cool compresses on forehead, around the neck, and under armpits.

**SEVERE: Heat Stroke.**

This is a serious, **life-threatening medical emergency**. It can happen in a few hours or less while working in a hot environment. The symptoms are reversible, but if not treated promptly, heat stroke can lead to permanent brain damage or death.

*Signs and Symptoms -*

- lack of sweating;
- hot, dry, flushed skin;
- deep rapid breathing;
- a rapid, weak, and possibly irregular pulse;
- headache, nausea;
- dizziness, confusion, or delirium; and
- loss of consciousness and convulsions.

*What Your Body is Doing -*

Your body becomes so overburdened that blood flow and sweat cannot cool your body sufficiently. Your body becomes overheated and your sweat glands and other organs cannot function normally. This can effect vital organs, including your heart and brain, and may cause permanent damage.

*Treatment -*

- rest in a cool or shady area;
- remove outer clothing;
- lower body temperature with cool compresses or pour water on clothing;
- increase air movement around body; and,
- drink water or other fluids, and DO NOT “ice down”.

- **Preventing Heat Stress - A Checklist**

Prevent heat stress by taking an active role in preventing heat-related problems. Know the factors that increase your risk and take steps to reduce them. Drink water and acclimatize yourself to the heat environment you may work in.

Supervisors and employees must be able to recognize health risks associated with working in areas and/or performing work activities that may contribute to heat stress.

The following items are suggested ideas and/or steps that supervisors and employees can take to help prevent heat stress:

- Know which factors contribute to heat stress. Discuss ways to reduce health risk. Discuss the increased risk when working in areas of high exposure to heat such as hot and humid days, or exposure to radiant heat from mechanical sources.
- Drink plenty of water. Do not wait until you are thirsty to drink water or other fluids. Thirst is not a good indicator of how much water your body needs. Increase the amount of water you drink to replenish the water you lose from sweating. Drink more water or other fluids than you need to satisfy your thirst. It is best to replenish regularly by drinking small amounts frequently throughout the work shift.
- Take frequent rest breaks. Depending on conditions; i. e., air temperature, sun exposure, or physical exertion, more frequent breaks may be needed.

- 
- Wear personnel protection equipment to guard against heat exposure. When possible wear comfortable loose, lightweight clothing, which allows body heat to be released. Cover your head.
  - Acclimatize to hot work. This usually requires several days of short periods of working in the heat gradually increasing work time and intensity. Consider alternative work schedules, work earlier or later, when heat is less severe.
  - Employees in good physical condition tend to acclimatize better because their cardiovascular systems respond better.
  - Eat light meals. Hot, heavy meals add heat to your body and divert blood to your digestive system. It is better to eat light during the workday when exposed to heat.
  - Avoid alcohol, caffeine, and medications. They act as diuretics and dehydrate the body. Medication used to control high blood pressure or allergies, including diabetes can increase your risk of heat stress.
  - In many job assignments, heat is a fact of life. Supervisors and employees should work together to reduce the risk of heat stress by monitoring and controlling the work environment. Supervisors should allow employees to adjust gradually to working in the heat.

## 8.16 COLD STRESS

- **General Information**

The body can take very little exposure to cold temperatures without the help of appropriate protective clothing. Unless properly protected, the body temperature drops and the person suffers some degree of cold stress.

Unless properly protected, cold temperatures can cause acute reactions to the body; hypothermia and frostbite.

Hypothermia occurs when the body loses heat faster than it can produce heat.

At first, the body temperature drops in the hands and feet. If the body continues to lose heat, involuntary shivers usually begin. This is the first real warning sign of hypothermia. If heat loss continues, the person will become confused and disoriented followed by coma and death, which can follow very quickly.

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Frostbite occurs when the hands or feet actually freeze with crystals of ice forming in the tissues and damaging them.

If the hand and/or foot is not too severely damaged, it may heal; but chronic symptoms such as pain, numbness or abnormal skin color may continue for years after the frostbite occurred. In extreme frostbite cases, gangrene may occur and amputation of the affected body part may be necessary.

Working in cold environments can overload your body, especially in rain, snow or other high-humidity conditions. These environmental conditions make it harder for your body to generate and maintain proper levels of internal heat to your hands, feet, ears, nose, and head.

Like heat stress, our bodies also vary in their ability to handle cold. You can avoid the adverse health and safety effects of cold stress by knowing your body and its limitations. Working in cold environments can overwork your body's mechanism that controls body temperature

Learn to understand cold stress by learning to recognize your body's warning signs; e.g., uncontrollable shivering, drowsiness, painful swelling in the hands and feet.

If you experience any of the above signs take immediate steps to stop further exposure to cold, and seek medical attention as soon as possible.

- **Preventing Cold Stress - A Checklist**

Supervisors and employees must be able to recognize health risks associated with working in areas and/or performing work activities that may contribute to cold stress. The following items can help prevent cold stress:

- > Knowing which factors contribute to cold stress and discuss ways to reduce cold temperature risks and take appropriate precautions.
- > Discuss the likelihood of increased risk when working in areas of high exposure to cold, such as fog, rain and snow.
- > Wear personnel protection clothing to protect your head, feet, and hands.
- > Avoid alcohol, caffeine, and medications.
- > Acclimatize to cold work environments. This usually requires several days of short periods of working in the cold, gradually increase in time and intensity. Consider alternative work schedules, work when cold is less severe.

- 
- > Insulate the body by wearing warm personal protective clothes.
  - > Pay attention to your hands, feet, and head. Since the body's internal heat regulator maintains the temperature of internal vital organs, employees must protect their extremities.
  - > Minimize exposure to air movement by using vehicles or other physical barriers as windshields for protection from wind and drafts.
  - > Stay dry and warm. If exposure to water is unavoidable, do not permit the exposure to be prolonged. Have dry clothes available.
  - > Eat a well-balanced diet and drink plenty of water.
  - > Cold hazards can be controlled either by designing work so that exposures are eliminated or minimized or by the use of protective clothing.
  - > Materials can be prefabricated or maintenance jobs preformed in warm areas and then the product moved to the cold area for final assembly.
  - > When work is being performed in the cold, rest breaks should be taken in warm areas and hot beverages should be available.
  - > Cover metal handles of tools and control bars with thermal insulation materials.
  - > Provide spot heating (portable heaters).
  - > Feet and hands, ears and nose are especially sensitive areas and should be well protected.



**WIND-CHILL INDEX**

<b>Wind speed in mph</b>	<b>ACTUAL THERMOMETER READING (F)</b>										
	50	40	30	20	10	0	-10	-20	-30	-40	
	<b>EQUIVALENT TEMPERATURE (F)</b>										
calm	50	40	30	20	10	0	-10	-20	-30	-40	
5	48	37	27	16	6	-5	-15	-26	-36	-47	
10	40	28	16	4	-9	-21	-33	-46	-58	-70	
15	36	22	9	-5	-18	-36	-45	-58	-72	-85	
20	32	18	4	-10	-25	-39	-53	-67	-82	-96	
25	30	16	0	-15	-29	-44	-59	-74	-88	-104	
30	28	13	-2	-18	-33	-48	-63	-79	-94	-109	
35	27	11	-4	-20	-35	-49	-67	-82	-98	-113	
40	26	10	-6	-21	-37	-53	-69	-85	-100	-116	
<b>Over 40 mph (little added effect)</b>	<b>LITTLE DANGER (for properly clothed person)</b>			<b>INCREASING DANGER (Danger from freezing of exposed flesh)</b>				<b>GREAT DANGER</b>			